

IMPACT OF OUTSOURCING ON
SYSTEMS INTEGRATION

INPUT

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Published by
INPUT
1953 Gallows Road, Suite 560
Vienna, VA 22182-3934
U.S.A.

U.S. Systems Integration Program
(SISIP)

Impact of Outsourcing on Systems Integration

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Abstract

Some industry analysts have reported a negative impact on the systems integration market by the outsourcing boon. However, the data collected for INPUT's new study *Impact of Outsourcing on Systems Integration* indicates the opposite. Outsourcing is creating additional systems integration requirements at user companies.

This study, one of a series on U.S. systems integration, was prepared as part of INPUT's U.S. Systems Integration Program. *Impact of Outsourcing on Systems Integration* probes how full-service solution providers are responding to the changing needs of users in the information systems market.

Competitive strategies, vendor strengths, and market trends are discussed from the viewpoint of major vendors in the information systems market.

Vendors that want to participate fully in the downsizing revolution will find INPUT's conclusions and recommendations of strategic value to their companies.

This report contains 62 pages and 25 exhibits.



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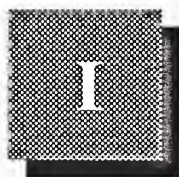
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Introduction

A

Purpose and Scope

INPUT conducted research to test whether or not the outsourcing trend is decreasing the number of traditional systems integration opportunities in the U.S. information systems market. As the information systems market shifts in response to changing user needs, traditional modes of delivering services to users is changing. Vendors are becoming solutions providers. They often find themselves in the position of filling all needs that a customer/prospect may request, rather than lose business. Users do not want to concern themselves with information systems (IS) requirements and technology. They are increasingly turning to one-stop shopping, especially if a relationship already exists with a vendor. Hiring one vendor to provide software, another to provide hardware, and another to set up networks is occurring with less frequency.

How vendors view outsourcing's impact on the more traditional systems integration market is the subject of this report. The vendor perspective is presented from a corporate-wide view. Executive, SI, and support services management representatives of the major vendors in the SI marketplace were interviewed expressly for this report.

INPUT uses the terms *buyer*, *customer*, *client*, and *user* interchangeably because the market uses them interchangeably. End users are referred to specifically, and may or may not be the buyer/customer/client/user.

Vendors were identified based on existing market presence in the commercial sector. Vendors exclusively in the federal sector were excluded. Outsourcing certainly present in the federal market is not expected to rise significantly any time in the near future. Outsourcing in the federal outsourcing market faces many uncertainties. The recent Department of Defense (DoD) consolidation initiative could lessen outsourcing opportunities for vendors or create one massive opportunity. In addition, the federal procurement process and contractor relationship rules discourage

the building of business partnerships found to be effective in building successful outsourcing relationships.

See Appendix A for INPUT's detailed definitions of systems integration (SI) and outsourcing (OS).

B

Methodology

Telephone interviews and informal discussions were conducted with representatives of the major vendors in the commercial systems integration market. A copy of the questionnaire is included as Appendix B of this report.

C

Report Organization

This report consists of the following additional chapters:

- Chapter II is an executive overview highlighting the major findings of this study.
- Chapter III—The Market for Services Vendors—addresses the purpose of this study. It presents an assessment of the impact of outsourcing on systems integration. Other market and competitive issues are also discussed.
- Chapter IV—Conclusions—summarizes overall IS market conditions and offers recommendations to SI/OS services vendors.

Two appendixes are also included in this report.

D

Related Reports

To help develop further comprehensive insight into the U.S. systems integration market, readers are encouraged to consult the following INPUT reports:

Methods for Successful Systems Integration, 1992

Systems Integration Competitive Analyses, 1991

Systems Integration Technology Trends

Subcontracting to Client Integrators

Systems Management Priorities and Directions

Systems Integration Competitive Analysis, 1992

Systems Integration Trends and Forecasts, 1992-1997

Impact of Downsizing on Systems Integration

Systems Integration Opportunities in Re-engineering

Networking Systems Integration Opportunities

Systems Operations Management Issues and Practices (1990)

Network Operations Management (1990)

Systems Operations Market Analysis, 1990-1995 (1991)

Systems Operations: Vendor Analysis (1991)

Systems Operations Buyer Issues and Alternatives (1991)

Systems Management Priorities and Directions (1991)

Systems Operations Market Analysis, 1991-1996 (1991)

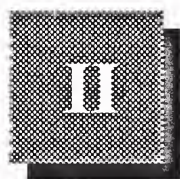
Methods of Approaching IS Outsourcing (1992)

Outsourcing Network Management Operations (1992)

Information Systems Outsourcing Opportunities, 1992-1997 (1992)

Outsourcing Desktop Services (1992)

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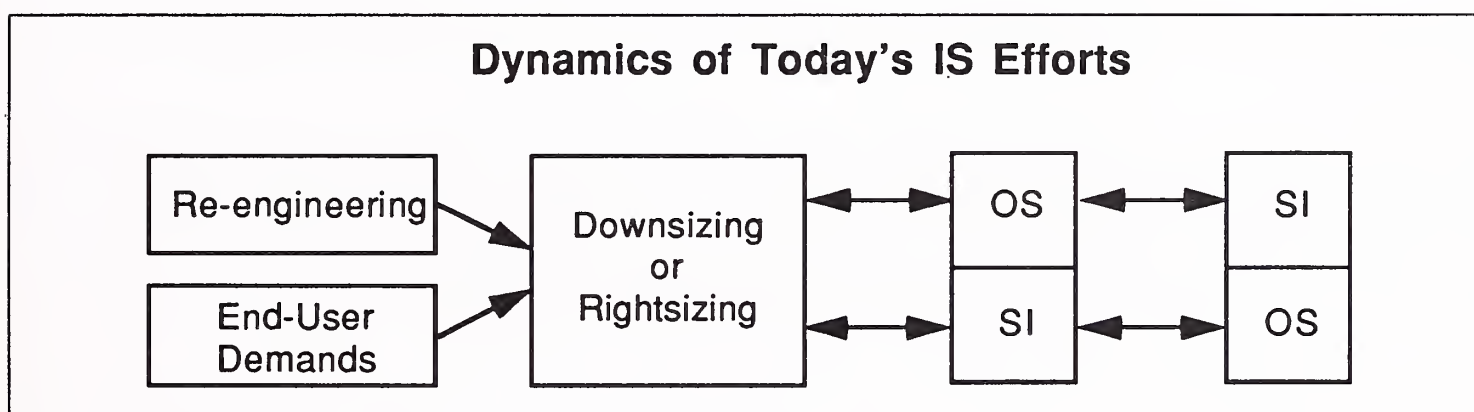
Executive Overview

A

The Dynamics of Today's IS Efforts

The interrelationships in today's information systems and services market is characterized in Exhibit II-1. At any point in the diagram a vendor can enter into a relationship with a customer.

EXHIBIT II-1



Re-engineering of workflow processes and end-user demands for computing power on their desktops are pressures that may be working together, or independently, in many organizations. Re-engineering of workflow processes is occurring as CEOs strive to reduce operating costs in a stagnant economy. Associated supporting IS structures are usually retooled to enable business processes to operate more efficiently and often are less redundant. End users are demanding user friendly, graphically oriented applications that run on desktop devices to perform daily job functions.

Both of these trends have an effect on the use of the right computing platform within the organization. This mostly results in downsizing of the computing environment to client/server technologies.

In order to effectively implement and manage the downsized environment, user organizations seek the services of IS vendors. Internal IS departments find it extremely challenging to deal with a multivendor computing environment. It is more cost effective and support services are improved when vendors are hired to perform new integration projects and handle day-to-day operating problems.

On the other hand, organizations that initially hire vendors to perform SI projects or outsourcing services, may find new systems require additional services or downsizing of computing platforms. These suggestions may be made by the vendor, which will usually offer to provide additional services at an extra charge. Vendors in this study said it is becoming common for customers to ask their SI vendors to take over system operations after developing a new system.

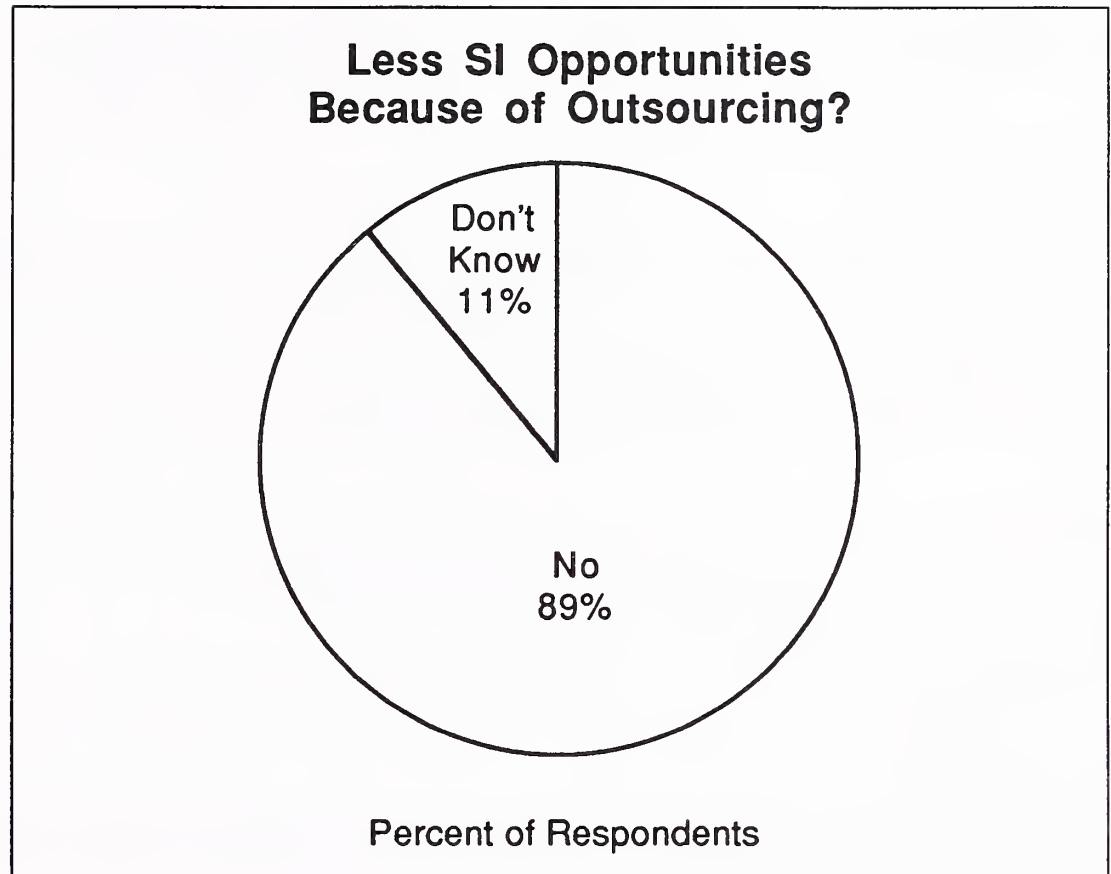
B

Outsourcing Stimulates SI Business

Participating vendors in this study are best characterized as “all-solution providers.” Both systems integration and outsourcing services are components of their products and services offerings to customers.

Eighty-nine percent of the vendors believe that outsourcing is stimulating SI opportunities, as shown in Exhibit II-2. More services and SI work is usually needed. As one major vendor said “the deals get more interesting and different as outsourcing develops. Large outsourcing deals often need program management and consulting skills” that may, or may not, have been defined in the original outsourcing contract.

EXHIBIT II-2



Vendors noted that most additional SI opportunities they saw were a result of their own contracts. Vendor comments and further data obtained by INPUT indicate that vendors receive additional SI type of work from at least 50% of their outsourcing contracts.

C **Outsourcing Isn't Just Data Center Operations—Don't Get Caught in Industry Semantics**

INPUT defines outsourcing to encompass five general categories of contractual arrangements, as shown in Exhibit II-3.

EXHIBIT II-3

Outsourcing Components	
Components	1992-1997 CAGR (Percent)
Platform operations	12
Applications operations	17
Application management	19
Network management	20
Desktop services	31

Users may contract for all of the above services or select on a modular basis those services that are more appropriate to their business purposes.

Traditional outsourcing as defined by many in the trade press usually is limited to a vendor managing data center operations. INPUT expects this type of outsourcing to sustain the lowest growth rate over the next few years, primarily due to the growth of downsizing.

Applications operations includes applications development and maintenance functions as well as operating and managing the customer's computer systems and networks. The development portion often entails a systems integration type of effort. Although the CAGR for this component of outsourcing is only 17%, actual user expenditures are expected at \$11.5 billion by 1997, the largest spending category for outsourcing services.

Applications management is concerned with vendor responsibility for development and maintenance of all applications systems a client uses to support a business function. This form of outsourcing is expected to grow from \$500 million to \$1.2 billion by 1997 at a CAGR of 19%.

Combined management of voice and data network operations will grow at a 20% CAGR and will be the smallest spending category for outsourcing services by 1992 at \$3.5 billion.

Desktop services includes services from a vendor for the deployment, maintenance, support, and connectivity of the firm's PC/workstation environment. INPUT currently estimates this subcategory of outsourcing to

reach \$4.4 billion by 1997. However, continuing research indicates this figure is a conservative estimate. INPUT expects to revise this forecast upwards in 1993.

D

Simultaneous SI and Outsourcing Needs Are Filled as One Requirement

User organizations are more likely to combine simultaneous requirements for SI and outsourcing (OS). As shown in Exhibit II-4, an outsourcing vendor, or a vendor with "full service" capabilities will probably win the contract.

EXHIBIT II-4

How Users Fill Simultaneous SI and Outsourcing Needs

Method	Average Percent of Users
Hire an OS vendor to perform both functions	55
Hire an OS vendor for outsourcing and an SI vendor for SI	35
Hire an SI vendor to perform both	10

Note: Will not add to 100% because each percent represents an average for each response set.

User organizations, especially if they are end users, do not normally categorize their needs using the industry terms *systems integration* and *outsourcing services*. Requirements are approached from a functional perspective in terms of what requirements or what business solutions need to be solved. Although users may have a multivendor operating environment, single vendor accountability is preferred in many cases.

E

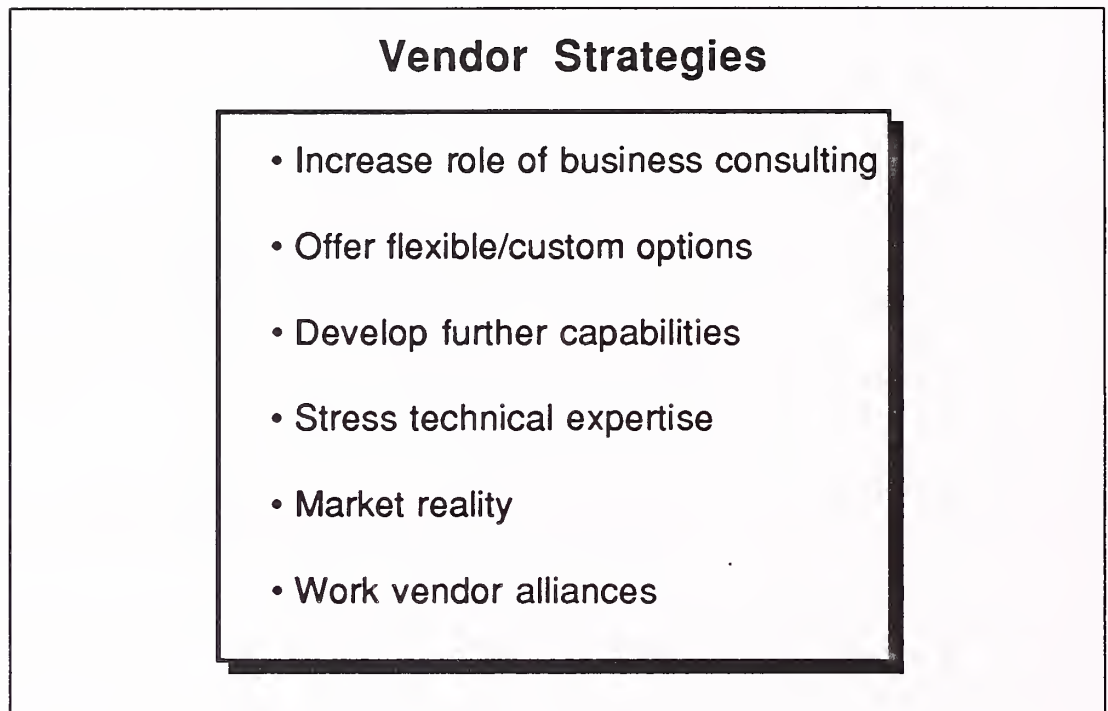
Vendor Recommendations

Vendor organizations should not remain as they are today if they intend to compete in the future OS/SI services market. A vendor cannot afford to

stagnate in terms of types of services offered, technical capabilities, contract options, and vendor alliances. Vendors must be flexible and willing to adapt to user requirements as they unfold in the rapidly changing computing environments presented by the desktop process.

To take advantage of the services needs of users in the 1990s, vendors should follow the strategies listed in Exhibit II-5.

EXHIBIT II-5

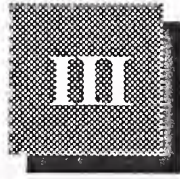


Vendors should market value-added capabilities to beat out competitors. In addition to current needs, users have potential and often unknown needs. Users may ask vendors what they can offer in “what if” scenarios.

To attract more SI and OS market share, vendors should offer flexible non-standard contract and services options. Vendors should keep abreast of innovative technology as it continues to enter the market.

Service vendors should stress the breadth of their technical abilities to attract buyers; future needs may require additional vendor capability. Marketing efforts should demonstrate to users how to harness computing power in their organizations and guarantee that “all parts will work together.”

Vendor alliances should be strengthened and developed to allow members to respond to users’ diverse needs.



The Market for Services Vendors

This chapter focuses on the primary purpose of this study: to assess the impact of outsourcing on systems integration. Separate sections focus on the “problem of industry semantics” for IS service providers and market motivators and on how vendors establish and protect their competitive positions.

A

Outsourcing Often Stimulates SI Business

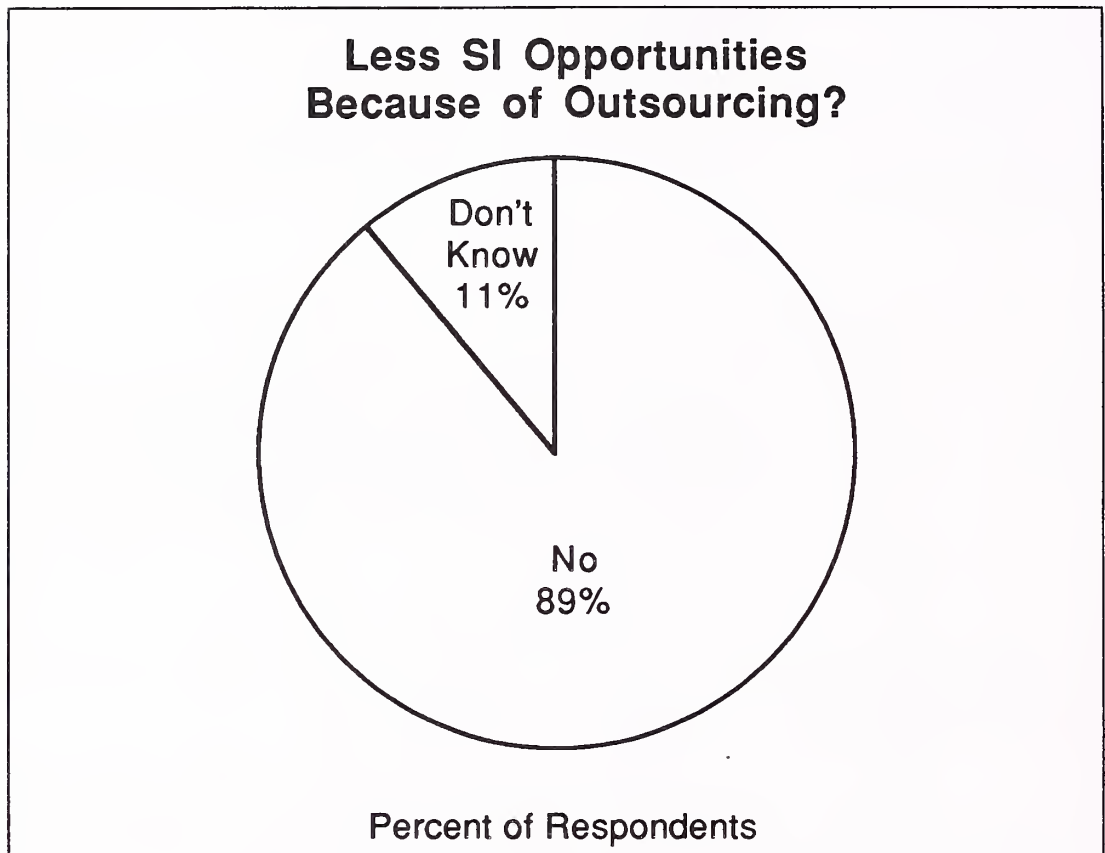
As Exhibit III-1 portrays, vendors in this study do not see less SI opportunities because of outsourcing. In fact, many actually believe outsourcing is generating more SI opportunities, especially when an existing outsourcing contract is in place. Once a decision to outsource some aspect of IS operations is made by a company, the propensity for the company to seek additional vendor services increases. Although vendors may have to push first-time buyers to use their services, satisfactory results from the first contract usually translate into additional business as users intensify their focus on their core business activities and choose to redesign and re-engineer more of their legacy systems.

One vendor mentioned that the savings incurred from outsourcing operations also has the effect of encouraging the customer to contract for SI services. User organizations feel they can apply any savings earned to new systems development without increasing overall IS expenses. This suggests a novel, yet effective, marketing tactic for the SI vendor and the outsourcing vendor.

Downsizing of computer operations to midsize and PC/workstation-based networks has the effect of legitimizing the need for vendor SI and outsourcing (OS) services. Internal IS departments find it extremely challenging to deal with a multivendor computing environment. It is time-consuming and resource-intensive in terms of people and skills. It is usually more cost-effective, and support needs within the organization are

improved when vendors are hired to perform SI projects and handle operation of the downsized environment.

EXHIBIT III-1

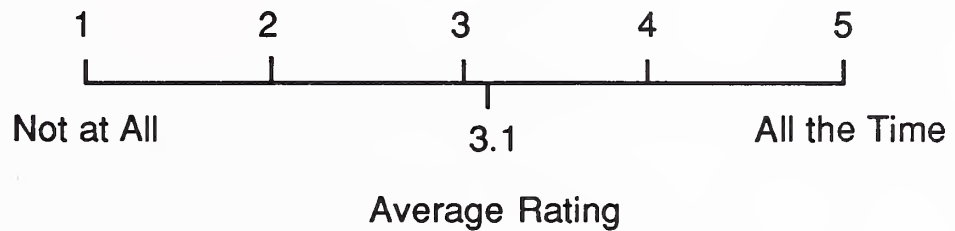


B

Existing Outsourcing Contractors Tend to Get SI Business

Often vendors receive additional SI business because of their outsourcing or services relationships with a customer. For this study, vendors were asked to rate how frequently they received additional SI business as a result of their outsourcing relationship with a customer. Their responses average 3.1 (as shown in Exhibit III-2) on a 5-point scale, where 5 meant "all the time." The average rating and vendors' comments suggest that 50% of outsourcing contracts result in additional SI business.

Frequency of Receiving Additional SI Business



a well-established SI reputation, the buyer usually seeks both an SI and OS contractor for respective services.

INPUT further queried vendors on their perception of the impact of outsourcing on SI opportunities in general. Exhibit III-3 indicates how vendors generally see outsourcing users filling their needs for SI or new applications development work.

EXHIBIT III-3

How OS Users Fill SI Needs	
Method	Average Percent of Users
Obtain through existing OS contracts	53
Obtain other vendor services	23
Utilize in-house personnel	29

Note: Will not add to 100% because each percent represents an average for each response set.

The response shown in Exhibit III-3 supports the assumption derived from the average frequency rating previously discussed in this section: that in approximately 50% of outsourcing contracts, the contractor receives additional SI business. An outsourcing user will infrequently seek another vendor's services, or fill new requirements using internal development personnel. As noted earlier once the buyer makes a decision to "vend out," subsequent needs will also be fulfilled by a vendor, and the existing vendor has at least a 50/50 chance of getting that work.

C

Separate SI and OS Vendors Are Rarely Hired

User organizations that have simultaneous SI and outsourcing needs are more inclined to use the services of an outsourcing vendor to fulfill both requirements, as shown in Exhibit III-4.

EXHIBIT III-4

How Users Fill Simultaneous SI and OS Needs

Method	Average Percent of Users
Hire an OS vendor to perform both	55
Hire an OS vendor for outsourcing and an SI vendor for SI	35
Hire an SI vendor to perform both	10

Note: Will not add to 100% because each percent represents an average for each response set.

Users are not necessarily seeking an outsourcing vendor, just a vendor that can fulfill their requirements. Few users, especially if the functional users are the buyers, differentiate their needs using the industry terms *systems integration* and *outsourcing services*. Users view their needs from a functional perspective in terms of “what jobs” need to be done. It is up to the vendor to respond with a solution. User organizations also prefer to use one vendor because it stops “finger pointing.” The vendor can not blame another vendor’s products or services when things go wrong. Single vendor responsibility means single vendor accountability.

IS departments are more likely to view outsourcing and systems integration as separate entities and seek separate vendors to perform each function, especially if pure data center management and applications development/management services are needed. This tendency, however, is diminishing for many reasons. IS management is off-loading more responsibilities over time and views one or fewer vendor relationships as less resource taxing internally. Multiple vendor relationships are confusing and complex to manage in today’s computing environments. A single point of accountability is gaining increasing favor with IS departments as “vending out” proves successful and more vendors structure themselves as full-service providers.

Most vendors in this study offer both SI and outsourcing services and see no evidence leading them to believe their companies are losing SI business because of other vendors’ outsourcing business. In fact, the “services pie” is perceived by many to be getting bigger. Customers’ business problems have interdependencies that are called SI or outsourcing by IS vendors. However, a vendor that participates in traditional SI contracts only will not

bid on joint requirement projects (SI and SO) and will probably not be aware of new SI opportunities filled by incumbent OS contractors.

D

Industry Semantics Get in the Way—Full-Service Provider Is the New Buzz Word to Describe Vendors

The industry classification for many vendors is changing or evolving as vendors position themselves to gain competitive advantage within the IS market. Users want vendors to respond to their business needs, and many vendors want to be able to respond to any business need or problem. Most of the vendors interviewed for this study consider themselves full-service providers. The current list of full-service capabilities is shown in Exhibit III-5. However, the number of services and possibly their names will probably change as users needs continue to drive the IS market.

EXHIBIT III-5

Full-Service Provider Capabilities

- Systems integration
- Outsourcing
 - Platform operations
 - Applications management
 - Applications maintenance
 - Network management
 - Desktop services
- Business function/process management
- Management consulting
- Technical consulting

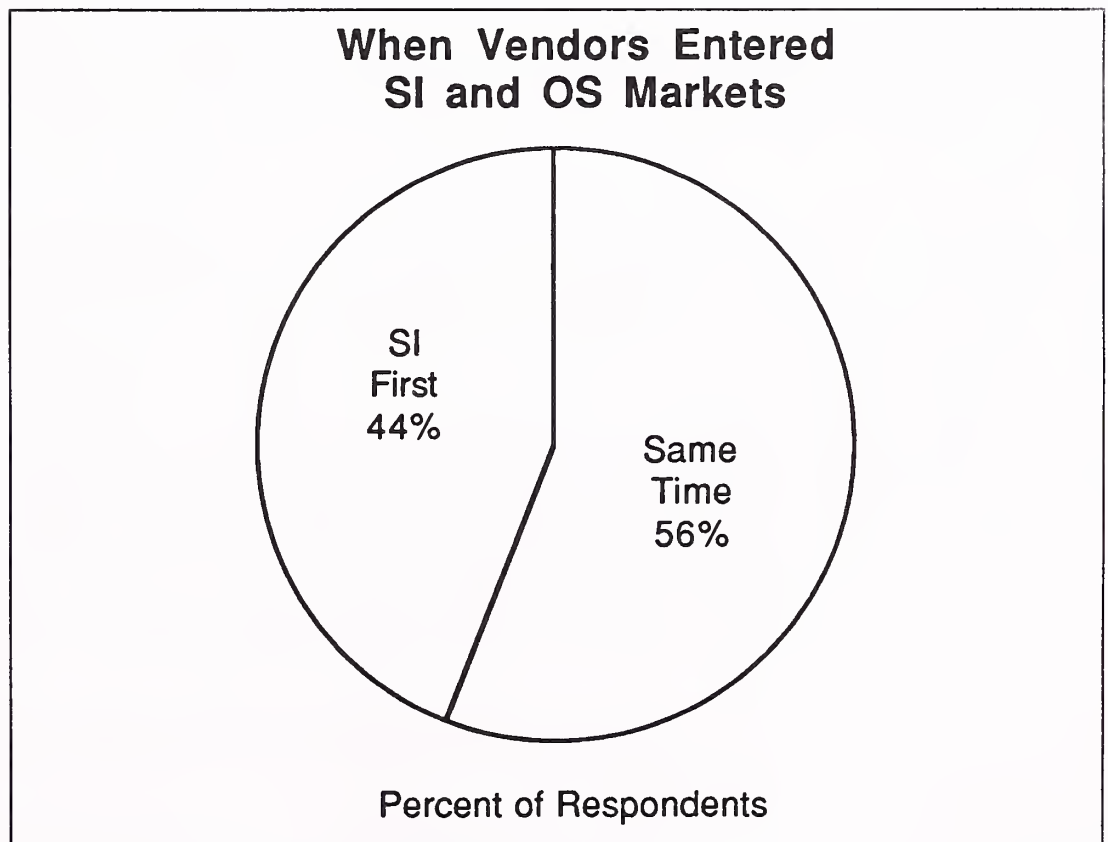
Vendors in this study emphasized that the terms *SI* and *OS* are no longer appropriate in the marketplace. These terms often carry negative

connotations to users. Many IS departments view outsourcing as “the kiss of death” to their empires. When companies outsource IS functions, IS departments lose headcount, responsibilities, and sometimes influence within the organization.

The term *systems integration* can sound intimidating to users who are unfamiliar with IS terminology. Vendors find it much more effective to speak in terms of business functions or problems that a user may seek a solution to. Often business problems are interdependent, combining both SI and OS solutions. *Outsourcing* in particular is often used as verb in the same sense as *vending out* is.

INPUT hypothesized that most vendors were in the SI market before entering the outsourcing market because SI as a service has been marketed longer than outsourcing. However, as Exhibit III-6 shows, vendor respondents are almost evenly split as to when they entered each market. Again, market semantics appears to be a problem. Core competencies in each market were developed concurrently by many vendors. The term *outsourcing* has only been in vogue for the past two to three years. Facilities management or data center operations, which INPUT calls platform operations, have been practiced by many vendors for almost as long as they have been in business.

EXHIBIT III-6



The term *outsourcing* has evolved from *facilities management* to encompass the myriad of services that users seek from vendors. Users are deciding to let vendors perform more life cycle management functions for their information systems as companies focus internal resources on developing their core or business competencies. A vendor may enter into a company's buying cycle by providing a service either through an outsourcing or systems integration contract.

The vendors in this study have remained in outsourcing or expanded their outsourcing services for the reasons ranked in Exhibit III-7.

EXHIBIT III-7

OS Market Motivations	
Reason	Rank*
Increase revenue/market	1
Round out services	1
Influence downsizing and re-engineering opportunities	3
Asked by SI customers	3
Capture SI opportunities through OS	5

*Rank based on frequency of mention by respondents (the higher the number the more often mentioned)

Providing outsourcing services is another way for vendors to increase their market potential, customer base, and associated revenue. Vendors also want to be known as an all-solution provider. Or they want to round out their service offerings. Vendors with existing SI or professional services relationships with customers can continue their relationships by providing other services, as the customer's life cycle system needs expand.

The following quote from John Fischer, vice president of Digital's Systems and Networks Operations Business, explains Digital's position on outsourcing:

Customers are rethinking "make or buy" decisions in all areas of their business. In many cases, turning over some or all of their I.T. operations, as a utility with Digital, provides a means to move to a

more competitive distributed computing environment while they focus their own attention on their core business. Digital's modular approach to outsourcing allows the customer to keep functions that they feel are strategic while divesting of areas where we can improve operations.

Another important reason why vendors are in the "outsourcing" business is to have the opportunity to influence downsizing and re-engineering opportunities at user companies. When a successful outsourcing relationship exists between the vendor and his customer, the vendor is in the position of performing as a consultant and suggests additional services that often translate into additional business for the specific vendor. A sole-source vendor scenario often develops. IS market success in the 1990s is dependent on the strength of the relationship between a customer and vendor.

Vendors also cited that they are often asked to assume operational responsibility upon completion of SI projects. Some believe this trend will dramatically increase in the next few years. It is becoming more common for customers to ask their SI vendors to take over system operations after developing a system. Once a user starts to "vend out," the propensity to "vend out" increases.

Those vendors performing applications management functions as part of their outsourcing contracts or with the technical and program management credentials to perform this function are in a better strategic position to capture additional SI engagements.

E

A Vendor's Multiple Strengths, Not Cost, Win Contracts

Each vendor company in this study possessed several strengths that enhanced the company's competitive advantage, according to respondents. Not one mentioned cost or pricing structures, as shown in Exhibit III-8. This is an expected bias because these were all vendor respondents, but user responses in other INPUT studies indicate users are also less concerned with the lowest cost solution than they were in the past.

EXHIBIT III-8

Competitive Strengths

- Full-range/service capabilities
- Global services
- Program management skills
- Flexible contract and services options
- Additional business strategy services
- End-user satisfaction focus
- Technical expertise

All vendor respondents mentioned at least three of the above reasons in assessing their company's strengths. As discussed earlier, vendors that possess full-service capabilities are in a better position to capture more contracts. In addition, those vendors with worldwide presence and support personnel can attract large companies with wide geographic dispersion. Systems that perform consistently using the same program management methodology can be implemented across geographic zones.

Program management skills are not only especially important in systems integration engagements but also for outsourcing arrangements. One major vendor commented that the "deals get more interesting and different as outsourcing develops. Large outsourcing deals often need program management and consulting skills." Change management and risk control procedures, for example, must be handled in both SI and OS relationships. An outsourcing contract may also include an SI component in the form of new systems development, and thus require more extensive program management skills than expected.

Vendors that customize their services offerings and contracts to satisfy customer needs find it easier to win contracts. Flexibility is especially critical in outsourcing contracts for platform operations and/or desktop services. Buyers do not want to feel restricted to only one method of handling platform operations functions. They want the flexibility to choose between:

- The vendor taking over the customer's existing assets and performing operations at the customer site or at the vendor's
- The vendor providing additional computing resources (either hardware and/or software) at the customer's site or at a central data center

At the desktop level a variety of component services may be needed. INPUT has defined them to include at least ten components:

- Purchasing consultation
- Equipment supply
- Software supply
- Equipment maintenance
- Installation services
- LAN management
- Help desk/user services
- User training
- Logistics management
- Network interface management

The ability of a vendor to offer each of the above functions independent of one another allows potential customers to pick and choose and start "vending out" or outsourcing on an incremental basis. This is especially important to first-time buyers of outsourcing that want to ease into relinquishing control of IS functions.

Users are buying help in many forms. Help is no longer limited to IS operational or development functions. Often business function and re-engineering consulting services are required before an IS solution can be implemented or modified to be cost effective and operationally successful to an organization. In the case of outsourcing deals, the customer may also require assistance in guiding their employees through transition to the vendor's operations. The customer may also rely on the vendor to provide outplacement services for employees who are displaced by the outsourcing contract.

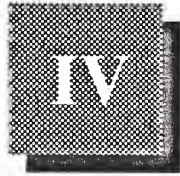
In the downsized environment, vendors are paying more attention to end-user satisfaction. It is no longer sufficient to deal only with the IS department. The end user must be happy with the look, feel, and support of the systems they operate. Vendors are targeting marketing efforts and customer satisfaction assessments to this group as responsibility for systems and financial power shifts to end users or the functional group within an organization. This presents a new challenge to a group that has traditionally had difficulty making contacts outside IS management.

Vendors mentioned frequently that technical expertise in networking, applications development and management, innovative technologies, and

vendor experience in the same or similar business environment are extremely helpful in winning services contracts. Users buy help to solve current business problems. They also are buying potential help for future needs. Users need to know their vendors can supply a range of services that will keep their companies in a competitive position within their industries.

F**Summary**

Outsourcing is creating additional services or SI opportunities for vendors. Outsourcing is making users feel more comfortable “vending out.” Users are buying help to solve business problems. Vendors that are positioned as “full-service providers” will fare better in the progression of the “vending out” market. The migration of users to the downsized information systems processing environment is stimulating the expertise that vendors can supply through outsourcing and SI services. This trend is expected to grow as the complexities of downsized environments force users to more effectively manage their organizations. It is unlikely that a surge in the economy will outweigh the practical aspects of desktop computing and give rise to the renewed growth of IS departments. Traditionally, a weak economy that hurts U.S. business has buoyed the market for services from vendors. Internal staffs are cut, and more cost containment and predictable services are demanded by CEOs. However, the complexity of today’s environment and future computing environments is likely to permanently necessitate users’ reliance on SI and outsourcing vendors.



Conclusions

Industry terms such as *systems integration*, *professional services*, *software development*, etc. are meaningless to most user organizations and are losing their utility as descriptors of services to vendors. Users want solutions and are less concerned with the nomenclature and components of services that the IS industry prefers to attach to them. To the user, the definitions are blurred. They just want a vendor to solve a business problem. The solutions, too, are not as simple as they were a few short years ago. Solutions today rarely involve just a pure software development effort. Machine capacity, network needs, training, support, and other services generally are parts of the common solution customers seek.

Many vendors have expanded their product and services offerings to capture the business of providing total "solutions" to their customers and expect to do even more in this area. Whether a vendor is able to respond as a prime contractor for all services requested is irrelevant to the vendor and, for the most part, to the customer. Most vendors are positioned to maximize revenue potential. Vendors will function as a prime or as a subcontractor, dependent on the circumstances of the contract. The customer assumes that their contracted vendor will handle "providing the service," and are unconcerned if subcontractors are involved. They have placed the responsibility for the "system and/or service" in the vendor's hands, and expect the vendor to manage any relationships that are required with other vendors.

A

Overall IS Market Conditions

The forces affecting all components of the IS market including SI and OS are as follows:

- Downsizing
- Business process re-engineering
- End-user involvement

- Customer emphasis
- Short-term benefit expectations
- More competition

The downsizing revolution sweeping across U.S. industry is requiring vendors to provide the right-size solution for many users. Right-sizing brings along with it associated needs for technical expertise in mid-sized and microprocessors as well as on the mainframe. Internal IS departments usually lack the technical qualifications to develop and manage a downsized environment, especially if it is geographically dispersed. Vendors usually possess the diversity of skills, or the means to acquire them, to satisfy user needs on a cost-effective basis. The sheer numbers of devices, types of hardware and software, connectivity issues, and end-user requirements are often too staggering for internal IS departments to manage. Downsizing is spurring the need for outsourcing and frequently requires new SI or applications development efforts.

Business process re-engineering is more than a bantered about phrase. Companies are analyzing their workflows and the information systems that support their business. As business processes are evaluated, their supporting information system processes are evaluated and often changed or replaced, providing a natural opportunity for vendors to provide solutions. Vendors want to be in the position of responding with a solution, regardless of the products and services required.

This process—which inevitably leads to application of the “new technologies” that are now available in imaging, GIS, multimedia, and LANs—make IS vendor services almost a guaranteed component of any solution. Multivendor computing is a necessity in information systems processing today. However, multivendor accountability does not work well in most organizations. Also, proprietary solutions are no longer acceptable, nor sufficient, to meet the needs of the corporate networked enterprise.

The ultimate consumer of IS services, the end user, is having more control over the information systems infrastructure in U.S. companies. This group often performs mission-critical functions for the organization. End users must be satisfied with the look and feel of the systems they use on a daily basis.

Although recent INPUT studies show that IS departments still ultimately make the decision to use vendor services, the advice and involvement of the functional end-user organizations are critical to ensure the success and ultimate acceptance of a systems or IS project. Vendors' marketing efforts and project management efforts therefore need to address the end users as well as the IS departments.

Different customer expectations are evident in the IS industry today. Users do not care what technology is used. They are not caught up in the

semantics used to define vendor services. In simple terms, an IS solution, or business process function enhancement, is sought from a vendor. Some users use the term *outsourcing* to refer to any IS service or software/hardware solution obtained from a vendor.

Vendors are expected to provide multiple services to their customers. Advice on strategic directions, innovative technology, personnel guidance and retraining during transitions to new platforms, and other value-added services are common expectations of IS buyers. Vendors can no longer “take the money and run.” Repeat business and their reputations are built on “service offerings” and a successful track record in today’s IS market.

Buyers also expect to see positive results or benefits to their company from their vendors within a short period of time. Cost savings and/or modular systems solutions should be visible early on in a contract. Buyers are no longer content to wait several years before seeing tangible results of their contracts with vendors.

Competition within the IS industry is intensifying as vendors vie for market share in the changing IS market. Revenues from traditional lines of business are decreasing. The downsizing trend is displacing many mainframe systems with smaller, inexpensive hardware. Off-the-shelf and multiple-vendor software components are used more frequently. Vendors planning to avoid being the victim of industry shake-out, are expanding their service offerings to capture the business needs of their customers. Costs play a large role in winning SI and OS, or “services,” contracts, but value-added services often decide the winning contractor, especially for those buyers that are outsourcing to improve their business function processes.

B

Recommendations to SI/OS or Services Vendors

The trend for the user community to “vend out” IS functions is expected to grow as the U.S. economy continues in its current state and the downsizing trend brings more information processing to the desktop. Vendors should follow the following strategies to position themselves to take advantage of the services needs of users:

- Increase role of business consulting
- Offer flexible/custom options
- Develop further capabilities
- Stress technical expertise
- Market reality
- Work with vendor alliances

As noted earlier, winning contracts is becoming less dependent on cost alone. Vendors that market other “value-added” capabilities in addition to responding to current needs will beat their competition. Users have both diverse and sometimes unknown needs. Many users ask vendors what can they offer in “what if” scenarios. Vendors that have the capability to provide strategic planning, business process re-engineering, transition assistance, varied technical capabilities, and knowledge of specific business process functions will be more appealing to the buyer/user of services. Buyers cannot be certain what their IS needs will be in two, three, or more years. The economy, technology, or their line of business orientation may change. Users look for vendors that can “go with the flow.” Outsourcing and SI contracts often span many years. The vendor must be able to adapt to the user’s evolving organizational and changing requirements for IS needs.

Vendors that offer flexible non-standard contract and services options will attract more buyers of SI and OS services. Especially for OS deals, the vendor’s capabilities should cover a range of platform services and performance location options, in addition to technical expertise. Potential buyers want choices in how they outsource operations. Buyers want to determine how the vendor will handle their information processing needs, not to leave that decision to the vendor. A vendor’s limited services offering should not dictate the outsourcing arrangement. Vendors should also tailor their contract pricing schedules to suit the unique processing or business services needs of the buyer.

Services vendors cannot afford to be content with existing capabilities. Innovative technology continues to pop into the market at a rapid pace. Vendors must continue to develop new technical strengths to keep up with rapidly evolving technology, and work at obtaining or improving specific business/industry expertise. Users are demanding their vendors keep them technologically up to date, and have experience in their industry. Vendor personnel can best respond to user needs if they share an understanding of the same business.

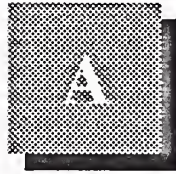
Vendors that stress the breadth of their technical capabilities should attract more services buyers. Although a buyer may not have an immediate need for a specific type of expertise, future needs may require this capability from a vendor.

Vendors should approach marketing efforts with more of a flavor of reality. Demonstrate to users how they can effectively harness and manage the computing power in their organizations. Users need vendors to guarantee that all components will work together in an heterogeneous networked computing environment. Internal IS user organizations cannot keep up with the technical requirements of supporting the desktop environment. Users’ needs in the 1990s will also continue to mount as desktop computing

becomes more complex and mission-critical applications move into the desktop operating environment.

It is critical for vendors to develop and strengthen alliances with other vendors that allow them to respond to diverse needs from customers. In the 1990s' computing environment, no computer is an island, and vendors need to rely on the capabilities of each other to respond to market demands.

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Definition of Terms

A

Introduction

INPUT's *Definition of Terms* provides the framework for all of INPUT's market analyses and forecasts of the information services industry. It is used for all U.S. programs. The structure defined in Exhibit A-1 is also used in Europe and for the worldwide forecast.

One of the strengths of INPUT's market analysis services is the consistency of the underlying market sizing and forecast data. Each year INPUT reviews its industry structure and makes changes if they are required. When changes are made they are carefully documented and the new definitions and forecasts reconciled to the prior definitions and forecasts. INPUT clients have the benefit of being able to track market forecast data from year to year against a proven and consistent foundation of definitions.

For 1992 INPUT has added one delivery mode and defined three new submodes to its Information Services Industry Structure:

- *Equipment Services* has been added as the ninth delivery mode. INPUT has forecasted the equipment maintenance, support and related services market through its Customer Services Programs for a number of years. Starting in 1992, the equipment services portion of the customer services market will be included in the total information services industry as defined by INPUT. Other portions of this market (such as software support) are already included.
- Two new submodes have been defined in the *Systems Operations* delivery mode - *desktop services* and *network management*. They are defined on pages 5 and 6.
- A fourth submode has been defined within the Professional Services delivery mode—*applications management*. This change reflects a shift in the way some software development and maintenance services are purchased. A complete definition is provided on page 6.

A series of definitions for computer equipment have also been added.

Changes from the 1991 INPUT *Definitions of Terms* are indicated with a ☆.

B

Overall Definitions and Analytical Framework

1. Information Services

Information Services are computer/telecommunications-related products and services that are oriented toward the development or use of information systems. Information services typically involve one or more of the following:

- Use of vendor-provided computer processing services to develop or run applications or provide services such as disaster recovery or data entry (called *Processing Services*)
- A combination of computer equipment, packaged software and associated support services which will meet an application systems need (called *Turnkey Systems*)
- Packaged software products, including systems software or applications software products (called *Software Products*)
- People services that support users in developing and operating their own information systems (called *Professional Services*)
- The combination of products (software and equipment) and services where the vendor assumes total responsibility for the development of a custom integrated solution to an information systems need (called *Systems Integration*)
- Services that provide operation and management of all or a significant part of a user's information systems functions under a long-term contract (called *Systems Operations*)
- Services that support the delivery of information in electronic form—typically network-oriented services such as value-added networks, electronic mail and document interchange (called *Network Applications*)
- Services that support the access and use of public and proprietary information such as on-line data bases and news services (called *Electronic Information Services*)
- Services that support the operation of computer and digital communication equipment (called *Equipment Services*)

In general, the market for information services does not involve providing equipment to users. The exception is where the equipment is part of an overall service offering such as a turnkey system, a systems operations contract, or a systems integration project.

The information services market also excludes pure data transport services (i.e., data or voice communications circuits). However, where information transport is associated with a network-based service (e.g., electronic data interchange services), or cannot be feasibly separated from other bundled services (e.g., some systems operations contracts), the transport costs are included as part of the services market.

The analytical framework of the information services industry consists of the following interacting factors: overall and industry-specific business environment (trends, events and issues); technology environment; user information system requirements; size and structure of information services markets; vendors and their products, services and revenues; distribution channels; and competitive issues.

2. Market Forecasts/User Expenditures

All information services market forecasts are estimates of *User Expenditures* for information services. When questions arise about the proper place to count these expenditures, INPUT addresses them from the user's viewpoint: expenditures are categorized according to what users perceive they are buying.

By focusing on user expenditures, INPUT avoids two problems which are related to the distribution channels for various categories of services:

- Double counting, which can occur by estimating total vendor revenues when there is significant reselling within the industry (e.g., software sales to turnkey vendors for repackaging and resale to end users)
- Missed counting, which can occur when sales to end users go through indirect channels such as mail order retailers

Captive Information Services User Expenditures are expenditures for products and services provided by a vendor that is part of the same parent corporation as the user. These expenditures are not included in INPUT forecasts.

Non-captive Information Services User Expenditures are expenditures that go to vendors that have a different parent corporation than the user. It is these expenditures which constitute the information services market analyzed by INPUT and that are included in INPUT forecasts.

3. Delivery Modes

Delivery Modes are defined as specific products and services that satisfy a given user need. While *Market Sectors* specify *who* the buyer is, *Delivery Modes* specify *what* the user is buying.

Of the nine delivery modes defined by INPUT, six are considered primary products or services:

- *Processing Services*
- *Network Services*
- *Professional Services*
- *Applications Software Products*
- *Systems Software Products*
- *Equipment Services*

The remaining three delivery modes represent combinations of these products and services, combined with equipment, management and/or other services:

- *Turnkey Systems*
- *Systems Operations*
- *Systems Integration*

Section C describes the delivery modes and their structure in more detail.

4. Market Sectors

Market Sectors or markets are groupings or categories of the buyers of information services. There are three types of user markets:

- *Vertical Industry* markets, such as Banking, Transportation, Utilities, etc. These are called “industry-specific” markets.
- *Functional Application* markets, such as Human Resources, Accounting, etc. These are called “cross-industry” markets.
- *Other* markets, which are neither industry- nor application-specific, such as the market for systems software products and much of the on-line data base market.

Specific market sectors used by INPUT are defined in Section E, below.

5. Trading Communities

Information technology is playing a major role in re-engineering, not just companies but the value chain or *Trading Communities* in which these companies operate. This re-engineering is resulting in electronic commerce emerging where interorganizational electronic systems facilitate the business processes of the trading community.

- A trading community is the group or organizations—commercial and non-commercial—involved in producing a good or services.
- Electronic commerce and trading communities are addressed in INPUT's EDI and Electronic Commerce Program.

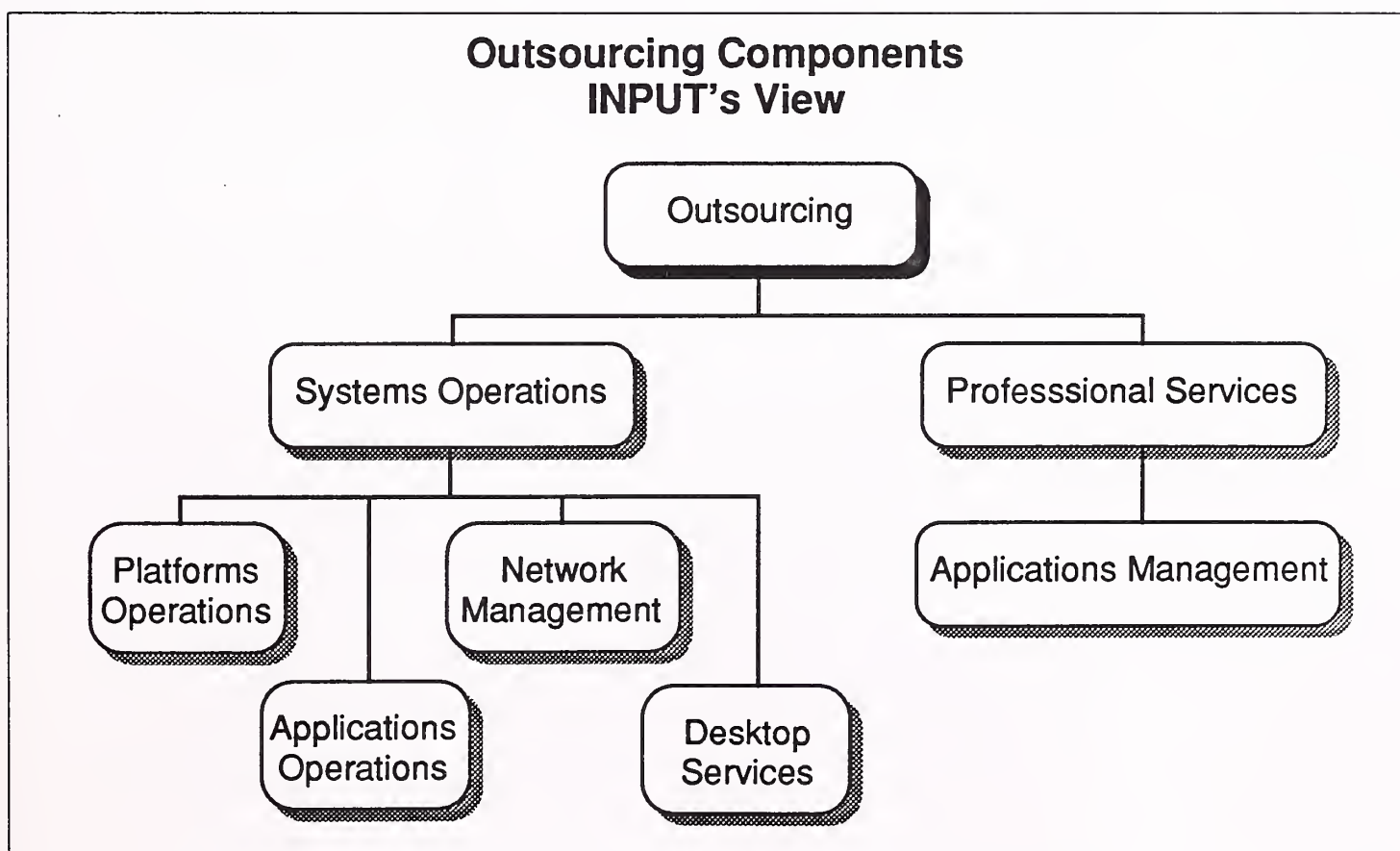
6. Outsourcing

Over the past few years a major change has occurred in the way clients are buying some information services. The shift has been labeled *outsourcing*.

INPUT views outsourcing as a change in the form of the client/vendor relationship. Under an outsourcing relationship, all or a major portion of the information systems function is contracted to a vendor in a long-term relationship. The vendor is responsible for the performance of the function.

INPUT considers the following submodes to be outsourcing-type relationships and in aggregate to represent the outsourcing market. See Exhibit A-1. Complete definitions are provided in Section C of this document. INPUT provides these forecasts as part of the corresponding delivery modes.

EXHIBIT A-1



- *Platform Systems Operations* - The vendor is responsible for managing and operating the client's computer systems.
- *Applications System Operations* - The vendor is responsible for developing and/or maintaining a client's applications as well as operating the computer systems.
- ☆ *Network Management* - The vendor assumes full responsibility for operating and managing the client's data communications systems. This may also include the voice communications of the client.
- ☆ *Applications Management/Maintenance* - The professional services vendor has full responsibility for developing and/or maintaining some or all of the applications systems that a client uses to support business operations. The services are provided on a long-term contractual basis.
- ☆ *Desktop Services* - The vendor assumes responsibility for the deployment, maintenance, and connectivity between the personal computers and/or intelligent workstations in the client organization. The services may also include performing the help-desk function. The services are provided on a long-term contractual basis.

C

Delivery Modes and Submodes

Exhibit A-2 provides the overall structure of the information services industry as defined and used by INPUT. This section of *Definition of Terms* provides definitions for each of the delivery modes and their submodes or components.

1. Software Products

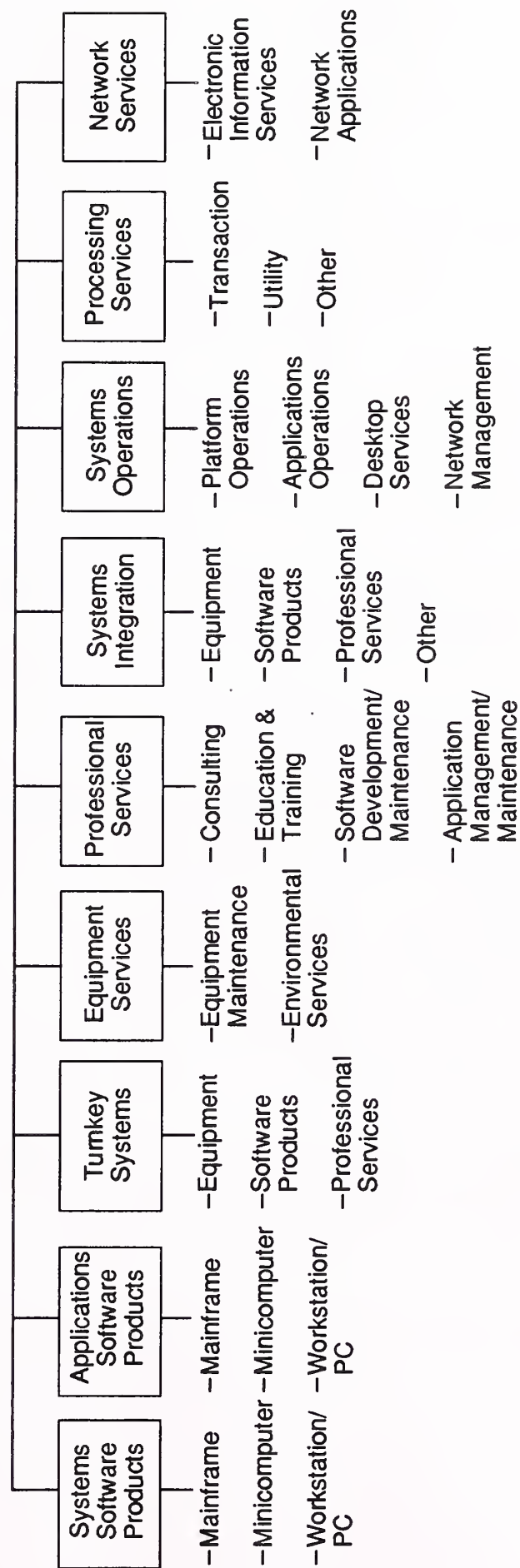
INPUT divides the software products market into two delivery modes: systems software and applications software.

The two delivery modes have many similarities. Both involve purchases of software packages for in-house computer systems. Included are both lease and purchase expenditures, as well as expenditures for work performed by the vendor to implement or maintain the package at the user's sites. Vendor-provided training or support in operation and use of the package, if part of the software pricing, is also included here.

Expenditures for work performed by organizations other than the package vendor are counted in the professional services delivery mode. Fees for work related to education, consulting, and/or custom modification of software products are also counted as professional services, provided such fees are charged separately from the price of the software product itself.

EXHIBIT A-2

Information Services Industry Structure—1992



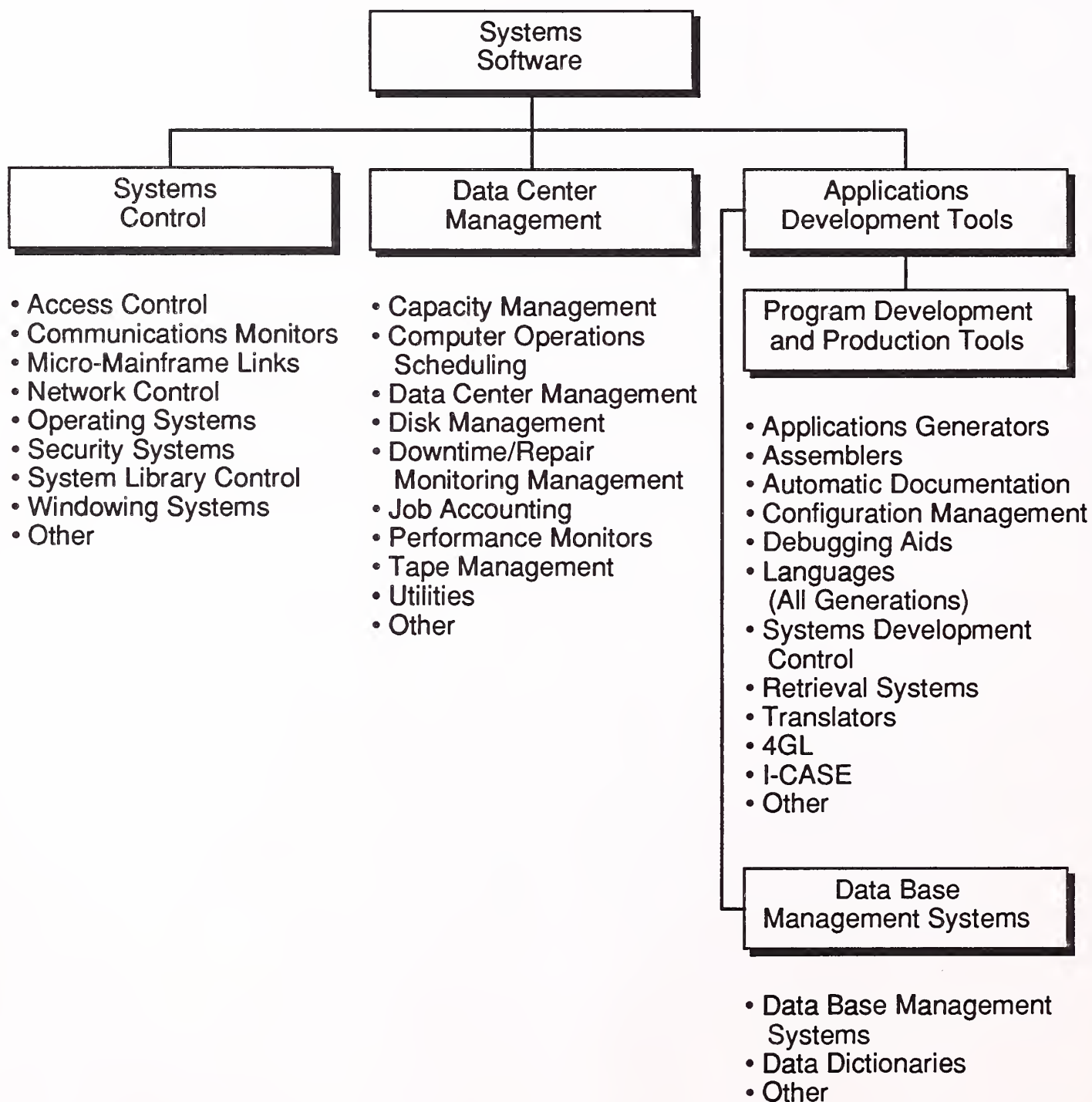
Source: INPUT

a. Systems Software Products

Systems software products enable the computer/communications system to perform basic machine-oriented or user interface functions. INPUT divides systems software products into three submodes. See Exhibit A-3.

EXHIBIT A-3

Systems Software Products Market Structure



- *Systems Control Products* - Software programs that manage computer system resources and control the execution of programs. These products include operating systems, emulators, network control, library control, windowing, access control, and spoolers.
- *Operations Management Tools* - Software programs used by operations personnel to manage the computer system and/or network resources and personnel more effectively. Included are performance measurement, job accounting, computer operation scheduling, disk management utilities, and capacity management.
- *Applications Development Tools* - Software programs used to prepare applications for execution by assisting in designing, programming, testing, and related functions. Included are traditional programming languages, 4GLs, data dictionaries, data base management systems, report writers, project control systems, CASE systems and other development productivity aids.

INPUT also forecasts the systems software products delivery mode by platform level: mainframe, minicomputer and workstation/PC.

b. Applications Software Products

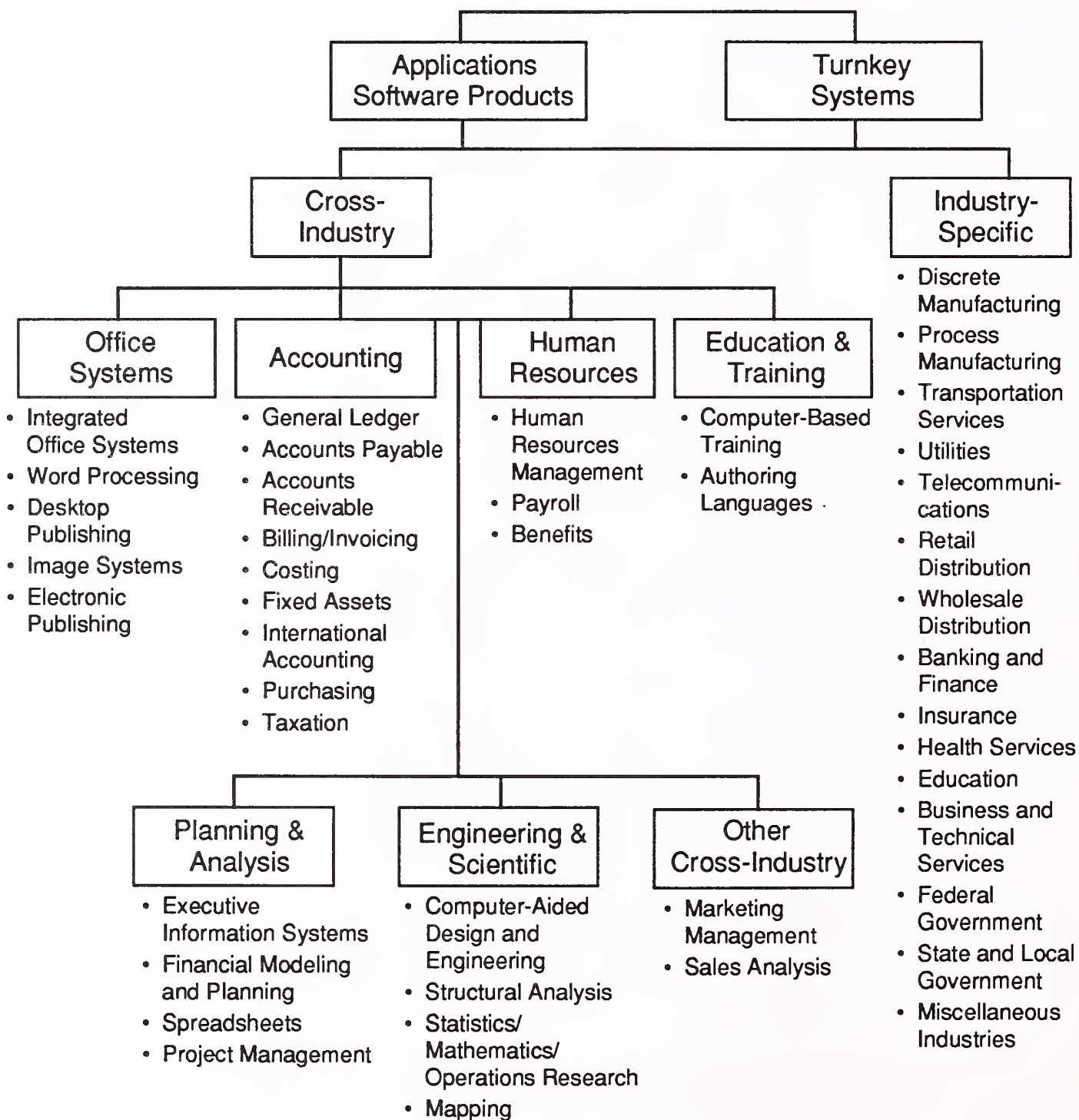
Applications software products enable a user or group of users to support an operational or administrative process within an organization. Examples include accounts payable, order entry, project management and office systems. INPUT categorizes applications software products into two groups of market sectors. (See Exhibit A-4.)

- *Industry Applications Software Products* - Software products that perform functions related to fulfilling business or organizational needs unique to a specific industry (vertical) market and sold to that market only. Examples include demand deposit accounting, MRPII, medical record keeping, automobile dealer parts inventory, etc.
- *Cross-Industry Applications Software Products* - Software products that perform a specific function that is applicable to a wide range of industry sectors. Examples include payroll and human resource systems, accounting systems, word processing and graphics systems, spreadsheets, etc.

INPUT also forecasts the applications software products delivery mode by platform level: mainframe, minicomputer and workstation/PC.

EXHIBIT A-4

Application Products and Turnkey Systems



2. Turnkey Systems

A turnkey system is an integration of equipment (CPU, peripherals, etc.), systems software, and packaged applications software into a single product developed to meet a specific set of user requirements. Value added by the turnkey system vendor is primarily in the software and professional services provided. INPUT categorizes turnkey systems into two groups of market sectors as it does for applications software products. (See Exhibit A-4.)

Most CAD/CAM systems and many small business systems are turnkey systems. Turnkey systems utilize standard computers and do not include specialized hardware such as word processors, cash registers, process control systems, or embedded computer systems for military applications.

Computer manufacturers (e.g., IBM or DEC) that combine software with their own general-purpose hardware are not classified by INPUT as turnkey vendors. Their software revenues are included in the appropriate software category.

Most turnkey systems are sold through channels known as value-added resellers.

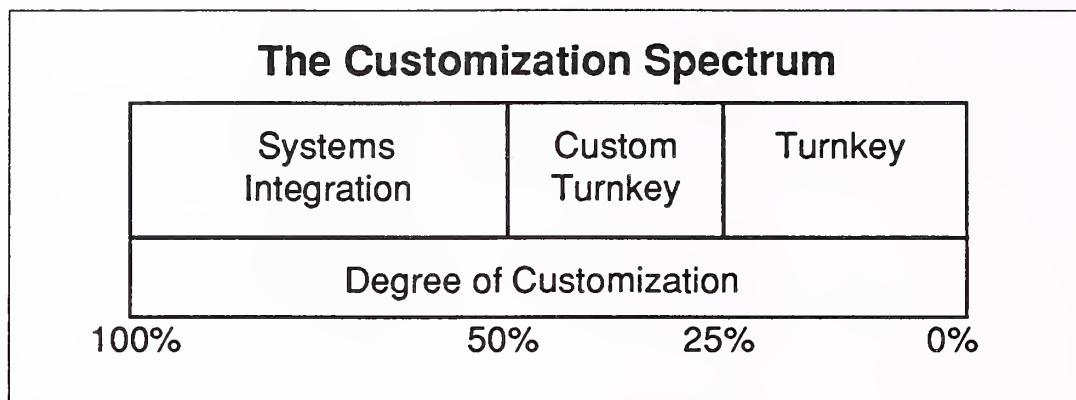
- *Value-Added Reseller (VAR)*: A VAR adds value to computer hardware and/or software and then resells it to an end user. The major value added is usually applications software for a vertical or cross-industry market, but also includes many of the other components of a turnkey systems solution, such as professional services, software support, and applications upgrades.

Turnkey systems have three components:

- Equipment - computer hardware supplied as part of the turnkey system
- Software products - prepackaged systems and applications software products
- Professional services - services to install or customize the system or train the user, provided as part of the turnkey system sale

Exhibit A-5 contrasts turnkey systems with systems integration. Turnkey systems are based on available software products that a vendor may modify to a modest degree.

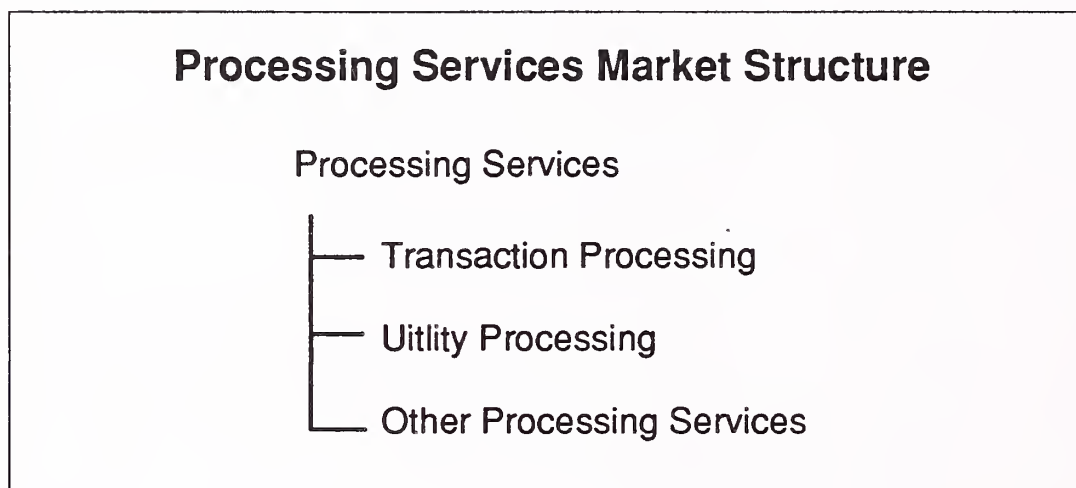
EXHIBIT A-5



3. Processing Services

This delivery mode includes three submodes: transaction processing, utility processing, and “other” processing services. See Exhibit A-6.

EXHIBIT A-6



- *Transaction Processing* - Client uses vendor-provided information systems—including hardware, software and/or data networks—at the vendor site or customer site to process specific applications and update client data bases. The application software is typically provided by the vendor.
- *Utility Processing* - Vendor provides basic software tools (language compilers, assemblers, DBMSs, graphics packages, mathematical models, scientific library routines, etc.), enabling clients to develop and/or operate their own programs or process data on the vendor’s system.
- *Other Processing Services* - Vendor provides service—usually at the vendor site—such as scanning and other data entry services, laser printing, computer output microfilm (COM), CD preparation and other data output services, backup and disaster recovery, etc.

4. Systems Operations

Systems operations as a delivery mode was introduced in the 1990 Market Analysis and Systems Operations programs. Previously called Facilities Management, this delivery mode was created by taking the Systems Operations submode out of both Processing Services and Professional Services. For 1992 the submodes have been defined as follows.

Systems operations involves the operation and management of all or a significant part of the client's information systems functions under a long-term contract. These services can be provided in either of two distinct submodes where the difference is whether the support of applications, as well as data center operations, is included.

- *Platform systems operations* - The vendor manages and operates the computer systems, to perform the client's business functions, without taking responsibility for the client's application systems.
- *Applications systems operations* - The vendor manages and operates the computer systems to perform the client's business functions, and is also responsible for maintaining, or developing and maintaining, the client's application systems.
- ☆ *Network Management* - The vendor assumes responsibility for operating and managing the client's data communications systems. This may also include the voice communications of the client. A network management outsourcing contract may include only the management services or the full costs of the communications services and equipment plus the management services.
- ☆ *Desktop Services* - The vendor assumes responsibility for the deployment, maintenance, and connectivity among the personal computers and/or workstations in the client organization. The services may also include performing the help-desk function. Equipment as well as services can be part of a desktop services outsourcing contract.

Note: This type of client service can also be provided through traditional professional services where the contractual criteria of outsourcing are not present.

Systems operations vendors now provide a wide variety of services in support of existing information systems. The vendor can plan, control, provide, operate, maintain and manage any or all components of the client's information systems environment (equipment, networks, applications systems), either at the client's site or the vendor's site.

Note: In the federal government market, systems operation services are also defined by equipment ownership with the terms “COCO” (Contractor-Owned, Contractor-Operated), and “GOCO” (Government-Owned, Contractor-Operated).

5. Systems Integration (SI)

Systems integration is a vendor service that provides a complete solution to an information system, networking or automation development requirement through the custom selection and implementation of a variety of information system products and services. A systems integrator is responsible for the overall management of a systems integration contract and is the single point of contact and responsibility to the buyer for the delivery of the specified system function, on schedule and at the contracted price. (Refer to Exhibit A-7.)

The components of a systems integration project are the following:

- *Equipment* - information processing and communications equipment required to build the systems solution. This component may include custom as well as off-the-shelf equipment to meet the unique needs of the project. The systems integration equipment category excludes turnkey systems by definition.
- *Software products* - prepackaged applications and systems software products.
- *Professional services* - the value-added component that adapts the equipment and develops, assembles, or modifies the software and hardware to meet the system's requirements. It includes all of the professional services activities required to develop, implement, and if included in the contract, operate an information system, including consulting, program/project management, design and integration, software development, education and training, documentation, and systems operations and maintenance.
- *Other services* - most systems integration contracts include other services and product expenditures that are not classified elsewhere. This category includes miscellaneous items such as engineering services, automation equipment, computer supplies, business support services and supplies, and other items required for a smooth development effort.

EXHIBIT A-7

Products/Services in Systems Integration Projects

Equipment

- Information systems
- Communications

Software Products

- Systems software
- Applications software

Professional Services

- Consulting
 - Feasibility and trade-off studies
 - Selection of equipment, network and software
- Program/project management
- Design/integration
 - Systems design
 - Installation of equipment, network, and software
 - Demonstration and testing
- Software development
 - Modification of software packages
 - Modification of existing software
 - Custom development of software
- Education/training and documentation
- Systems operations/maintenance

Other Miscellaneous Products/Services

- Site preparation
- Data processing supplies
- Processing/network services
- Data/voice communication services

6. Professional Services

This category includes four submodes: consulting, education and training, software development, and applications management. Exhibit A-8 provides additional detail.

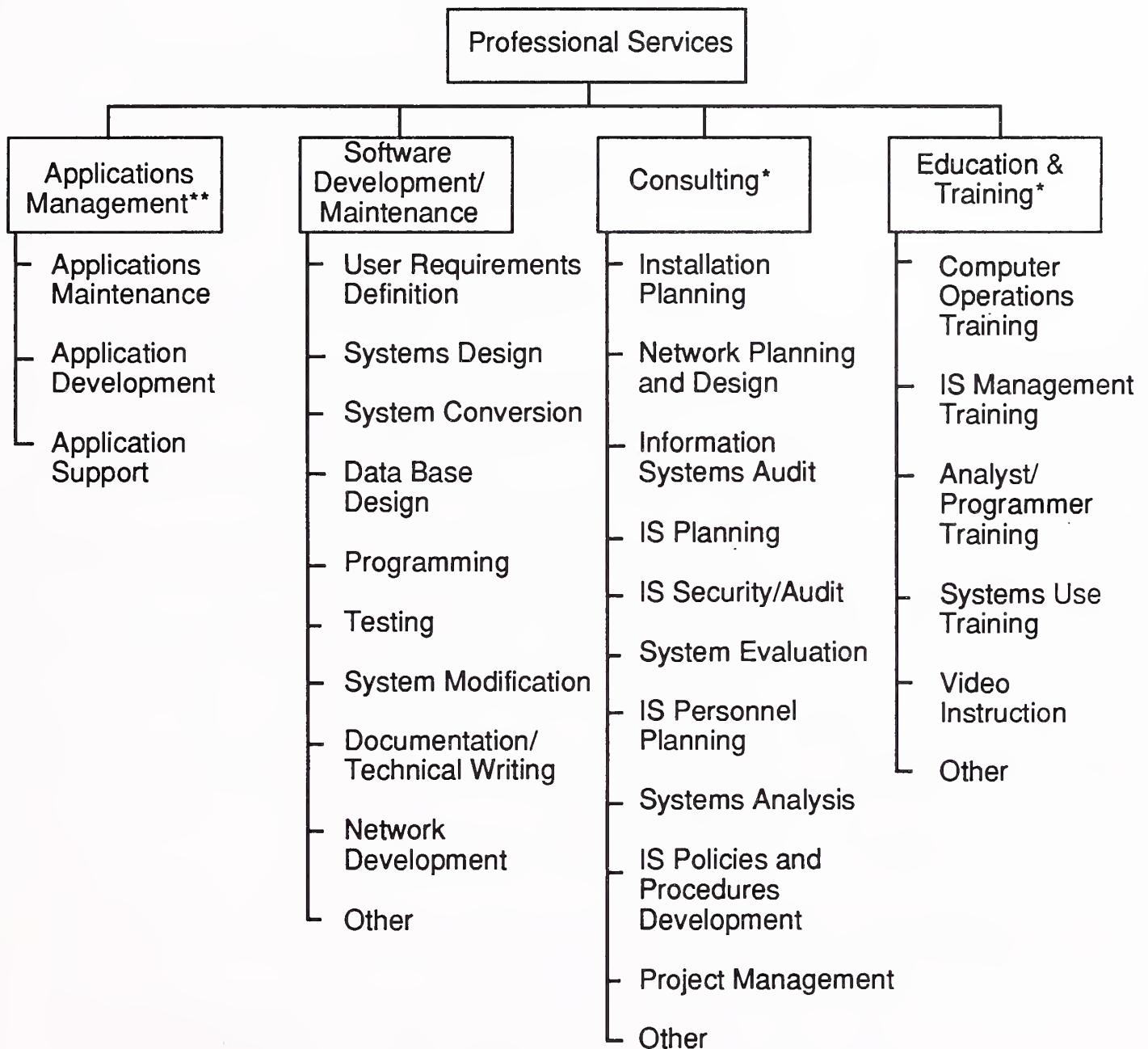
- *Consulting:* Services include management consulting (related to information systems), information systems re-engineering, information systems consulting, feasibility analysis and cost-effectiveness studies, and project management assistance. Services may be related to any aspect of the information system, including equipment, software, networks and systems operations.
- *Education and Training:* Services that provide training and education or the development of training materials related to information systems and services for the information systems professional and the user, including computer-aided instruction, computer-based education, and vendor instruction of user personnel in operations, design, programming, and documentation. Education and training provided by school systems are not included. General education and training products are included as a cross-industry market sector.
- *Software Development:* Services include user requirements definition, systems design, contract programming, documentation, and implementation of software performed on a custom basis. Conversion and maintenance services are also included.
- ☆ *Applications Management:* The vendor has full responsibility for maintaining and upgrading some or all of the application systems that a client uses to support business operations and may develop and implement new application systems for the client.

An applications management contract differs from traditional software development in the form of the client/vendor relationship. Under traditional software development services the relationship is project based. Under applications management it is time and function based.

These services may be provided in combination or separately from platform systems operations.

EXHIBIT A-8

Professional Services Market Structure



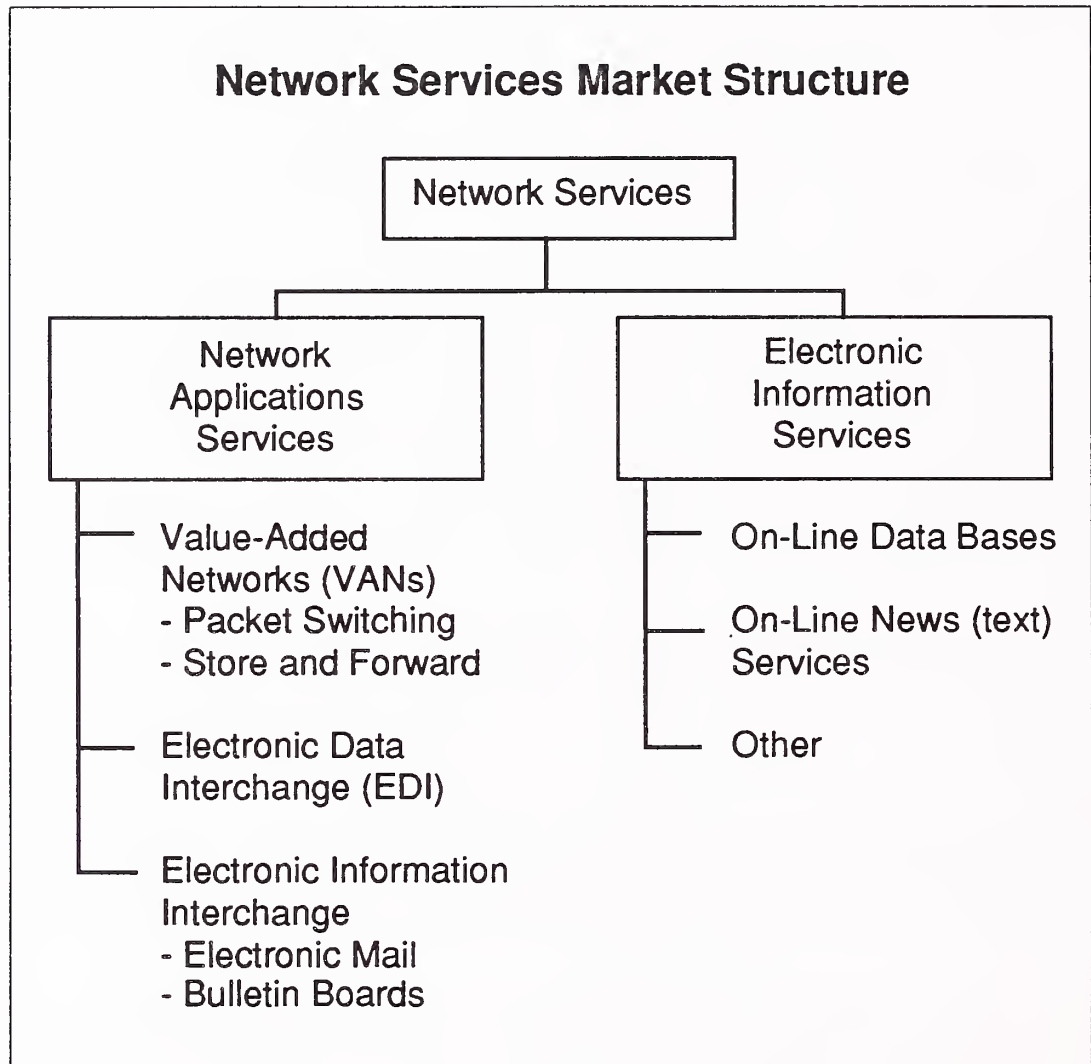
*Related to computer systems, topics, or issues

**Vendor assumes full responsibility on contracted longer term basis

7. Network Services

Network services are a variety of telecommunications-based functions and operations. Network service includes two submodes, as shown in Exhibit A-9.

EXHIBIT A-9



a. Electronic Information Services

Electronic information services are data bases that provide specific information via terminal- or computer-based inquiry, including items such as stock prices, legal precedents, economic indicators, periodical literature, medical diagnosis, airline schedules, automobile valuations, etc. The terminals used may be computers themselves, such as communications servers or personal computers.

Users inquire into and extract information from the data bases. They may load extracted data into their own computer systems; the vendor does not provide data processing or manipulation capability as part of the electronic information service and users cannot update the vendor's data bases. However, the vendor may offer other services (network applications or processing services) that do offer processing or manipulation capability.

The two kinds of electronic information services are:

- *On-line Data Bases* - Structured, primarily numerical data on economic and demographic trends, financial instruments, companies, products, materials, etc.
- Unstructured, primarily textual information on people, companies, events, etc. These are often news services.

While electronic information services have traditionally been delivered via networks, there is a growing trend toward the use of CD ROM optical disks to support or supplant on-line services, and these optical disk-based systems are included in the definition of this delivery mode.

b. Network Applications

Value-Added Network Services (VAN Services) - VAN services are enhanced transport services which involve adding such functions as automatic error detection and correction, protocol conversion, and store-and-forward message switching to the provision of basic network circuits.

While VAN services were originally provided only by specialized VAN carriers (Tymnet, Telenet, etc.), today these services are also offered by traditional common carriers (AT&T, Sprint, etc.). Meanwhile, the VAN carriers have also branched into the traditional common carriers' markets and are offering unenhanced basic network circuits as well.

Electronic Data Interchange (EDI) - Application-to-application electronic exchange of business data between trade partners or facilitators using a telecommunications network.

Electronic Information Interchange - The transmission of messages across an electronic network managed by a services vendor, including electronic mail, voice mail, voice messaging, and access to Telex, TWX, and other messaging services. This also includes bulletin board services.

8. Equipment Services

- ☆ The equipment services delivery mode includes two submodes. Both deal with the support and maintenance of computer equipment.
- ☆ *Equipment Maintenance* - Services provided to repair, diagnose problems and provide preventive maintenance both on-site and off-site for computer equipment. The costs of parts, media and other supplies are excluded. These services are typically provided on a contract basis.
- ☆ *Environmental Services* - Composed of equipment and data center related special services such as cabling, air conditioning and power supply, equipment relocation and similar services.

D

Computer Equipment

- ☆ These definitions have been included to provide the basis for market segmentation in the software products markets.
- ☆ *Computer Equipment* - Includes all computer and telecommunications equipment that can be separately acquired with or without installation by the vendor and not acquired as part of an integrated system. Unless otherwise noted in an INPUT forecast, computer equipment is only included where it is part of the purchase of services or software products (e.g., turnkey systems and systems integration).
- ☆ *Peripherals* - Includes all input, output, communications, and storage devices (other than main memory) that can be channel connected to a processor, and generally cannot be included in other categories such as terminals.
- ☆ *Input Devices* - Includes keyboards, numeric pads, card readers, light pens and track balls, tape readers, position and motion sensors, and analog-to-digital converters.
- ☆ *Output Devices* - Includes printers, CRTs, projection television screens, micrographics processors, digital graphics, and plotters
- ☆ *Communication Devices* - Includes modem, encryption equipment, special interfaces, and error control
- ☆ *Storage Devices* - Includes magnetic tape (reel, cartridge, and cassette), floppy and hard disks, solid state (integrated circuits), and bubble and optical memories

- ☆ *Computer Systems* - Includes all processors from personal computers to supercomputers. Computer systems may require type- or model-unique operating software to be functional, but this category excludes applications software and peripheral devices and processors or CPUs not provided as part of an integrated (turnkey) system.
- ☆ *Personal computers* - Smaller computers using 8-, 16-, or 32-bit computer technology. Generally designed to sit on a desktop and are portable for individual use. Price generally less than \$5,000.
- ☆ *Workstations* - High-performance, desktop, single-user computers often employing Reduced Instruction Set Computing (RISC). Workstations provide integrated, high-speed, local network-based services such as data base access, file storage and back-up, remote communications, and peripheral support. These products usually cost from \$5,000 to \$15,000.
- ☆ *Minicomputer or midsize computers* - Minicomputers are generally priced from \$15,000 to \$350,000. Many of the emerging client/server computers are in this category.
- ☆ *Mainframe or large computers* - Traditional mainframe and supercomputers costing more than \$350,000.

E

Sector Definitions

1. Industry Sector Definitions

INPUT structures the information services market into industry sectors such as process manufacturing, insurance, transportation, etc. The definitions of these sectors are based on the 1987 revision of the Standard Industrial Classification (SIC) code system. The specific industries (and their SIC codes) included under these industry sectors are detailed in Exhibit A-10.

INPUT includes all delivery modes except systems software products and equipment services in industry market sectors. See Exhibit A-9 and section E-3 (Delivery Mode Reporting by Sector).

Note: SIC code 88 is Personal Households. INPUT does not currently analyze or forecast information services in this market sector.

EXHIBIT A-10

Industry Sector Definitions

Industry Sector	SIC Code	Description
Discrete Manufacturing	23xx	Apparel and other finished products
	25xx	Furniture and fixtures
	27xx	Printing, publishing and allied industries
	31xx	Leather and leather products
	34xx	Fabricated metal products, except machinery and transportation equipment
	35xx	Industrial and commercial machinery and computer equipment
	36xx	Electronic and other electrical equipment and components, except computer equipment
	37xx	Transportation equipment
	38xx	Instruments; photo/med/optical goods; watches/clocks
	39xx	Miscellaneous manufacturing industry
Process Manufacturing	10xx	Metal mining
	12xx	Coal mining
	13xx	Oil and gas extraction
	14xx	Mining/quarrying nonmetallic minerals
	20xx	Food and kindred products
	21xx	Tobacco products
	22xx	Textile mill products
	24xx	Lumber and wood products, except furniture
	26xx	Paper and allied products
	28xx	Chemicals and allied products
	29xx	Petroleum refining and related industries
	30xx	Rubber and miscellaneous plastic products
	32xx	Stone, clay, glass and concrete products
	33xx	Primary metal industries
Transportation Services	40xx	Railroad transport
	41xx	Public transit/transport
	42xx	Motor freight transport/warehousing
	43xx	U.S. Postal Service
	44xx	Water transportation
	45xx	Air transportation (including airline reservation services in 4512)
	46xx	Pipelines, except natural gas
	47xx	Transportation services (including 472x, arrangement of passenger transportation)

EXHIBIT A-10 (CONT.)

Industry Sector Definitions

Industry Sector	SIC Code	Description
Telecommunications	48xx	Communications
Utilities	49xx	Electric, gas and sanitary services
Retail Distribution	52xx 53xx 54xx 55xx 56xx 57xx 58xx 59xx	Building materials General merchandise stores Food stores Automotive dealers, gas stations Apparel and accessory stores Home furniture, furnishings and accessory stores Eating and drinking places Miscellaneous retail
Wholesale Distribution	50xx 51xx	Wholesale trade - durable goods Wholesale trade - nondurable goods
Banking and Finance	60xx 61xx 62xx 67xx	Depository institutions Nondepository institutions Security and commodity brokers, dealers, exchanges and services Holding and other investment offices
Insurance	63xx 64xx	Insurance carriers Insurance agents, brokers and services
Health Services	80xx	Health services
Education	82xx	Educational services

EXHIBIT A-10 (CONT.)

Industry Sector Definitions

Industry Sector	SIC Code	Description
Business Services	65xx	Real estate
	70xx	Hotels, rooming houses, camps, and other lodging places
	72xx	Personal services
	73xx	Business services (except hotel reservation services in 7389)
	7389x	Hotel reservation services
	75xx	Automotive repair, services and parking
	76xx	Miscellaneous repair services
	78xx	Motion pictures
	79xx	Amusement and recreation services
	81xx	Legal services
	83xx	Social services
	84xx	Museums, art galleries, and botanical/zoological gardens
	86xx	Membership organizations
	87xx	Engineering, accounting, research, management, and related services
	89xx	Miscellaneous services
Federal Government	9xxx	
State and Local Government	9xxx	
Miscellaneous Industries	01xx	Agricultural production - crops
	02xx	Agricultural production - livestock/animals
	07xx	Agricultural services
	08xx	Forestry
	09xx	Fishing, hunting and trapping
	15xx	Building construction - general contractors, operative builders
	16xx	Heavy construction - contractors
	17xx	Construction - special trade contractors

2. Cross-Industry Sector Definitions

INPUT has identified seven cross-industry market sectors. These sectors or markets involve multi-industry applications such as human resource systems, accounting systems, etc.

- In order to be included in an industry sector, the service or product delivered must be specific to that sector only. If a service or product is used in more than one industry sector, it is counted as cross-industry.
- INPUT only includes the turnkey systems, applications software products, and transaction processing services in the cross-industry sectors.

The seven cross-industry markets are:

Accounting - consists of applications software products and information services that serve such functions as:

- General ledger
 - Financial management
 - Accounts payable
 - Accounts receivable
 - Billing/invoicing
 - Fixed assets
 - International accounting
 - Purchasing
 - Taxation
 - Financial consolidation
- Excluded are accounting products and services directed to a specific industry, such as tax processing services for CPAs and accountants within the business services industry sector.

Human Resources - consists of application solutions purchased by multiple industry sectors to serve the functions of human resources management and payroll. Examples of specific applications within these two major functions are:

- Employee relations
- Benefits administration
- Government compliance
- Manpower planning
- Compensation administration
- Applicant tracking
- Position control
- Payroll processing

Education and Training - consists of education and training for information systems professionals and users of information systems delivered as a software product, turnkey system or through processing services. The market for computer-based training tools for the training of any employee on any subject is also included.

Office Systems consists of the following:

- Integrated office systems (IOS)
 - Word processing
 - Desktop publishing
 - Electronic publishing
 - Image systems
- IOSs—such as IBM's OfficeVision, HP's NewWave Office and DEC's All-In-1—typically include the following core functions, all of which are accessed from the same desktop: electronic mail, decision support systems, time management and filing systems.
 - Office systems graphics include presentation graphics (which represent the bulk of office systems graphics), paint and line art, page description languages, and electronic form programs.
 - The fundamental difference between electronic publishing and desktop publishing (within the office systems sector) is that electronic publishing encompasses a method of document management and control from a single point—regardless of how many authors/locations work on a document—whereas desktop publishing is a personal productivity tool and is generally a lower end product residing on a personal computer.
 - Electronic or computer publishing systems that are sold strictly and specifically to commercial publishers, printers, and typesetters are excluded from cross-industry consideration and are included in the discrete manufacturing industry.

Engineering and Scientific encompasses the following applications:

- Computer-aided design and engineering (CAD and CAE)
 - Structural analysis
 - Statistics/mathematics/operations research
 - Mapping/GIS
- Computer-aided manufacturing (CAM) or CAD that is integrated with CAM is excluded from the cross-industry sector as it is specific to the manufacturing industries. CAD or CAE that is dedicated to integrated circuit design is also excluded because it is specific to the semiconductor industry.

Planning and Analysis consists of software products and information services in four application areas:

- Executive Information Systems (EIS)
- Financial modeling or planning systems
- Spreadsheets
- Project management

Other encompasses marketing/sales and electronic publishing application solutions.

• Sales and marketing includes:

- Sales analysis
- Marketing management
- Demographic market planning models

3. Delivery Mode Reporting by Sector

This section describes how the delivery mode forecasts relate to the market sector forecasts. Exhibit A-11 summarizes the relationships.

- *Processing services* - The transaction processing services submode is forecasted for each industry and cross-industry market sector. The utility and other processing services submodes are forecasted in total market in the general market sector.
- *Turnkey systems* - Turnkey systems is forecasted for the 15 industry and 7 cross-industry sectors. Each component of turnkey systems is forecasted in each sector.
- *Applications software products* - The applications software products delivery mode is forecasted for the 15 industry and 7 cross-industry sectors. In addition, each forecast is broken down by platform level: mainframe, minicomputer and workstation/PC.
- *Systems operations* - Each of the systems operations submodes is forecasted for each of the 15 industry sectors.
- *Systems integration* - Systems integration and each of the components of systems integration are forecasted for each of the 15 industry sectors.
- *Professional services* - Professional services and each of the submodes is forecasted for each of the 15 industry sectors.

EXHIBIT A-11

Delivery Mode versus Market Sector Forecast Content

Delivery Mode	Submode	Market Sectors		
		Industry Sectors	Cross-Industry Sectors	General
Processing Services	Transaction Utility Other	X	X	X X
Turnkey Systems		X	X	
Applications Software Products		X	X	
Systems Operations	Platform Applications	X X		
Systems Integration		X		
Professional Services		X		
Network Services	Network Applications Electronic Information Services	X X		X
Systems Software Products				X
Equipment Services				X

- *Network services* - The network applications submode of network services forecasted for each of the 15 industry sectors.

Industry and cross-industry electronic information services are forecast in relevant market sectors. The remainder of electronic information services is forecasted in total for the general market sector.

- *Systems software products* - Systems software products and its submodes are forecasted in total for the general market sector. Each submode forecast is broken down by platform level: mainframe, mini-computer and workstation/PC.

- *Equipment services* - Equipment services and its submodes are forecasted in total in the general market sectors.

F**Vendor Revenue and User Expenditure Conversion**

The size of the information services market may be viewed from two perspectives: vendor (producer) revenues and user expenditures. INPUT defines and forecasts the information services market in terms of user expenditures. User expenditures reflect the markup in producer sales when a product such as software is delivered through indirect distribution channels (such as original equipment manufacturers (OEMs), retailers and distributors). The focus on user expenditure also eliminates the double counting of revenues that would occur if sales were tabulated for both producer (e.g., Lotus) and distributor (e.g., ComputerLand).

For most delivery modes, vendor revenues and user expenditures are fairly close. However, there are some areas of significant difference. Many microcomputer software products, for example, are marketed through distribution channels. To capture the value added through these distribution channels, adjustment factors are used to convert estimated information services vendor revenues to user expenditures.

For some delivery modes, including software products, systems integration and turnkey systems, there is a significant volume of intra-industry sales. For example, systems integrators purchase software and subcontract the services of other professional services vendors. Turnkey vendors incorporate purchased software into the systems they sell to users.

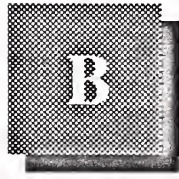
To account for such intra-industry transactions, INPUT uses conversion ratios to derive the estimate of end-user expenditures.

Exhibit A-12 summarizes the net effect of the various ratios used by INPUT to convert vendor revenues to user expenditure (market size) figures for each delivery mode.

EXHIBIT A-12

**Vendor Revenue to
User Expenditure Conversion**

Delivery Mode	Vendor Revenue Multiplier
Applications Software Products	1.18
Systems Software Products	1.10
Systems Operations	0.95
Systems Integration	0.95
Professional Services	0.99
Network Services	0.99
Processing Services	0.99
Turnkey Systems	0.95
Equipment Services	0.99



Questionnaire

The following definitions were used to respond to this study:

Systems Integration (SI) - A complete solution to an information system, networking or automation requirement through the custom selection and implementation of a variety of information systems products and services. Systems integration contracts include most or all of the following: equipment, software products, professional services, and other services.

Systems Integrator - Is responsible for the overall management of a systems integration contract and is the single point of contact and has responsibility to the buyer for the delivery of the specified system function, on schedule and at the contracted price.

Outsourcing (OS) - Contracting for all or a major portion of an information systems function or process to a vendor on a long-term basis. Components include the following:

Platform Operations - The vendor is responsible for managing the computer systems and their associated networks.

Applications Operations - The vendor is responsible for managing the computer system, the network, and the applications software for the client.

Network Management - Contracting to a vendor for the operations and management of the computer-related telecommunications network, transmitting data, voice, image, text, and local-area and wide-area networks. Voice-only network operations are not part of information systems outsourcing.

Desktop Services - Contracting out to a vendor for the deployment, maintenance, support, and connectivity of the firm's PC/workstation

inventory. The service may also include performing the help desk function.

Applications Management - The vendor is responsible for the development and maintenance of all applications systems a client uses to support a business operation.

Applications Maintenance - Contracting out only for the maintenance of the existing applications software associated with a business operation.

Vendor Questionnaire

Company Confidential

1. Which of the following services does your company offer to customers: (check all that apply)

Systems integration	_____
Outsourcing:	
Platform operations	_____
Applications management	_____
Applications maintenance	_____
Network management	_____
Desktop services	_____

- 2a. In your opinion, is your company losing SI business because users are having SI functions fulfilled as part of other vendor's OS contracts? (check one)

Yes	_____
No	_____

- 2b. Please estimate how much potential revenue is lost because of this situation.

Enter amount: \$_____

IF SI VENDOR ONLY, GO TO QUESTION 5

- 3a. Was your company an SI vendor prior to entering the outsourcing market? (check one)

Yes	_____
No	_____

- 3b. Why did your company enter the outsourcing market? (check all that apply)

Generally increase revenue/market potential	_____
Capture SI opportunities as an extension of OS business	_____
Influence downsizing and re-engineering opportunities at companies	_____
Was asked to perform OS upon completion of SI projects	_____
Protect SI/professional services relationships at existing customer	_____
sites/become all solution provider	
Other (specify):	_____

4. Using a 1-5 scale, where 5=all the time and 1= not at all, rate how frequently your company receives additional SI business from a customer as a by-product of your relationship with the customer as an outsourcing vendor.

Circle one 1 2 3 4 5

5. What strategies, or qualifications, gives your company a competitive edge in the services market?

- 6a. Overall, does your company think there are less SI opportunities because of the growth of outsourcing? (check one)

Yes _____
 No _____
 Don't know _____

- 6b. Why?

7. Indicate what percent of OS users (platform operations and/or applications management) fill their needs for SI or new applications development by using each of the following:

**Enter
Percent**

Through existing OS contracts	_____
Obtain other vendor services	_____
Utilize in-house personnel	_____

8. In your opinion, when companies have both SI and OS needs (but no existing contracts), indicate what percent tend to fill their requirements by . . .

**Indicate
Percent**

Hiring an OS vendor to perform both	_____
Hiring an OS vendor for outsourcing and an SI vendor for SI	_____
Hiring an SI vendor to perform both	_____

